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EXAMINER

DANIELS, ANTHONY J

ART UNIT

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Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
2. Claim 5 is objected to because of the following informalities: On line 2, "...one of frame signals..." should be one frame of signals. Appropriate correction is required.

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-7,12,13,19-21,24,25,28,30,31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al. (US # 6,072,526) in view of Tamune (US # 6,940,556).

As to claim 1, Hashimoto et al. teaches an image capturing system (Figure 3) for correction of colors in an image (Figure 3, amplifiers “A1” and “A2”), comprising: a camera (Figure 3) including a lens (Figure 3, lens “301”), an image capturing device (Figure 3, image sensor device “303”), light detecting elements (Figure 3, image sensor device “303”; *{Pixels are inherent in image sensor devices.}*), each of the image capturing devices and the light detecting elements having a plurality of color channels (Col. 5, Lines 64-67; *{R and B channels are the color channels}*), a light-color measuring portion obtaining a value from one pixel or an average value from a plurality of pixels, for each of the color channels as reference signal values, out of reflected light from a scene received by the light detecting elements (Figure 3, white balance signals “B” of “G/B” and “R” of “G/R” are the reference signals; Col. 5, Lines 64-67; Col. 6, Lines 1-40); and a correction unit (Figure 3, amplifiers “A1” and “A2”) for correction of colors in the image by the reference signal values (Col. 6, Lines 40-43). The claim differs from Hashimoto et al. in that it further requires a reflection surface for capture of a main scene in the image capturing device and for capture in another image capture device; the reflection surface being disposed within a visual field of the camera for reflection of light from a reference scene disposed near the main scene for reception by the light detecting elements via the lens and the reference signals being determined from the reference scene.

In the same field of endeavor, Tamune teaches an electronic still camera (Figure 1) which employs two image capturing devices (Figure 1, image capturing device for photographing “73” and image capturing device for scene analysis “86”; *{The reference scene is referred to as light entering the lens at an angle, and the main scene is light not entering the lens at an angle (i.e. light entering on the path shown in Figure 1. Both scenes are reflected by the quick return*

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mirror.}}). The first image-capturing device is used for photographing a main scene, and the second image-capturing device is used for scene analysis (color correction) (Col. 4, Lines 43-52; Col. 6, Lines 54-67). Light is sent to the scene analysis image-capturing device via a quick return mirror (Figure 1, quick return mirror "71"; *{The examiner refers to the reflecting surface as the quick return mirror and the lens "301" of HASHIMOTO et al.}*), which reflects the incoming light to said image capturing device (Col. 4, Lines 38-47). In light of the teaching of Tamune, it would have been obvious to one of ordinary skill in the art to include the quick return mirror and second image-capturing device for the white balance calculation in Hashimoto et al. in parallel to the image sensor device "303" of Hashimoto et al., because an artisan of ordinary skill in the art would recognize that this would reduce the amount of time required for image processing which is implemented by the analyzing the photographic scene (see Tamune, Col. 1, Lines 56-60).

As to claim 2, Hashimoto et al., as modified by Tamune, teaches the image capturing system according to claim 1, wherein the correction unit is a correcting portion for practical division by the reference signal values obtained for each of the color channels (see Hashimoto et al., Figure 3, amplifiers "A1", "A2"; *{The gain for each amplifier is shown in Figure 3 (G/R and G/B). Multiplying by G/R is equivalent to multiplying by G and **dividing by R** . The same applies for G/B .}*), of respective main signal values at each of corresponding locations on coordinates in the main scene captured by the image capturing devices (see Hashimoto et al., Figure 3; *{Main scene signals follow path to the input of A1 and A2 (i.e. base of the triangle representing the amplifiers.)}*), whereby obtaining corrected signal values as corrected values of the main signal value (see Hashimoto et al., Figure 3, R' and B' entering the color reproducing correcting circuit).

As to claim 3, Hashimoto et al., as modified by Tamune, teaches the image processing unit used in the image capturing system according to claim 2, wherein coefficients (see Hashimoto et al., Figure 3, G/R and G/B) having the reference signal values as respective denominators are obtained in advance (see Tamune, Figure 5, Figure 7), for respective multiplication of these coefficients with the main signal values (see Hashimoto et al., Figure 3, G/R and G/B are gains), whereby performing correction of the main signal (see Hashimoto et al., Figure 3, R' and B' entering the color reproducing circuit).

As to claim 4, Hashimoto et al., as modified by Tamune, teaches the image processing unit according to claim 3, wherein the coefficients have denominators respectively represented by the corresponding reference signal values (see Hashimoto et al., Figure 3, G/R and G/B), and a numerator represented by another coefficient(s) common to all of the color channels (see Hashimoto et al., Figure 3, G common to G/R and G/B).

As to claim 5, Hashimoto et al., as modified by Tamune, teaches the image processing unit according to claim 4, wherein the coefficients are obtained from one frame of signals sequentially sent from the image capturing devices or the light detecting elements (see Tamune, separate image capturing device for scene analyzing "86" (one frame)), said coefficients being multiplied respectively with the main signal values obtained from another frame signal received at a later time (see Tamune, image capturing device for photographing "73" (another frame); Figure 5, Figure 7; full press- after half-press; Col. 4, Lines 38-55), whereby performing correction of the main signal (see Hashimoto et al., Figure 3, R' and B' entering the color reproducing circuit).

As to claim 6, Hashimoto et al., as modified by Tamune, teaches the image processing unit according to claim 5, wherein the coefficients are multiplied respectively with a plurality of sets of the main signal values obtained from the plurality of other frames, whereby performing correction of the main signal (see Hashimoto et al., Col. 5, Lines 64-67; "...video output...).

As to claim 7, Hashimoto et al., as modified by Tamune, teaches the image processing unit according to claim 5, further including a video amplifier for multiplication of the coefficients with the signals from the other frames (see Hashimoto et al., Figure 3, amplifiers "A1" and "A2").

As to claim 12, Hashimoto et al., as modified by Tamune, teaches the camera used in the image capturing system according to claim 1, further including a reflection surface moving mechanism capable of disposing the reflection surface out of the visual field of the camera (see Tamune, Figure 1; Col. 4, Lines 48-52).

As to claim 13, Hashimoto et al., as modified by Tamune, teaches the image capturing system according to claim 1, further comprising a reflection surface moving mechanism capable of disposing the reflection surface out of the visual field of the camera for disposition of the reflection surface out of the visual field of the camera by the reflection surface after obtaining the reference signal values for capture of the main image, the main signal values being corrected based on the reference signal values (see Tamune, Figure 5, Figure 7; Col. 4, Lines 38-55).

As to claim 19, Hashimoto et al., as modified by Tamune, teaches the camera used in the image capturing system according to claim 1, wherein each of the image capturing devices and the light detecting elements is constituted by an individual element of a same characteristic (*All*

pixels on the image capturing devices produce a charge or voltage proportional to the amount of light incident.)).

As to claim **20**, Hashimoto et al., as modified by Tamune, teaches the camera according to claim 19, wherein the light detecting elements are part of the image capturing devices respectively (*This inherent in the image capturing devices of Hashimoto et al. and Tamune.*).

As to claim **21**, Hashimoto et al., as modified by Tamune, teaches the camera used in the image capturing system according to claim 1, further including a storing portion for storage of an image file containing images captured in the image capturing devices or a holding portion for storage of a film recorded with said images, said images containing the reference image portion located at an end portion of an overall image region (*It is inherent that the reference images are stored in the microcomputer when computing the G/B and G/R ratios. The end region of the overall image region is referred to as the scene analysis image capturing device.})). The claim differs from Hashimoto et al., as modified by Tamune, in that it further requires that the storage portion store the main scene images.*

In the same field of endeavor, Tamune teaches storing images from a main scene in a memory (Figure 1, camera internal memory "30"; Col. 5, Lines 21-29). In light of the teaching of Tamune, it would have been obvious to one of ordinary skill in the art to include a memory in the camera of Hashimoto et al., because an artisan of ordinary skill in the art would recognize that this would allow the user to review images taken prior to current use.

As to claim **24**, Hashimoto et al., as modified by Tamune, teaches the camera used in the image capturing system according to claim 1, wherein the main image is laterally elongated rectangular, the reference image portion being placed at an upper portion or a lower portion of

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the overall image region (see Hashimoto et al., Figure 3, image sensor device “303”; *{A CCD device is either a square or a rectangle. In both cases, the image on the CCD is rectangular with laterally elongated sides. See claim 21 for overall image definition.}*).

As to claim **25**, Hashimoto et al., as modified by Tamune, teaches the camera used in the image capturing system according to claim 1. Although Hashimoto et al., as modified by Tamune, does not state it explicitly, **Official Notice** is taken that the use of adjustable focus lenses and zoom lenses are well known and expected in the art (*Applicant is directed to claim 1, where examiner defines reflection surface as quick return mirror of Tamune and lens “301” of Hashimoto et al. Each time the focal length of the lens is changed, the angle and starting point of the reflection surface (partly lens “301”) is changed.*). One of ordinary skill in the art would have been motivated to use a focus adjustable lens and a zoom lens, because lenses of the sort have adjustable features, which help provide a user with the clearest, most natural looking picture.

As to claim **28**, Hashimoto et al., as modified by Tamune, teaches a recording medium recorded with software to be located into a computer for execution of the function realized by the image processing unit according to Claim 3 (see Hashimoto et al., CPU “314”).

As to claim **30**, Hashimoto et al., as modified by Tamune, teaches the camera according to any one of claims 13 or 19 – 25. Although it is not stated explicitly, **Official Notice** is taken that the concept of using mechanical shutters to prevent light from entering an image sensing device is well-known and expected in the art. One of ordinary skill in the art would recognize that this is a quick, effective way to control exposure time.

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As to claim **31**, Hashimoto et al. teaches an image capturing system (Figure 1) for stabilization of intensity in an image (Figure 1, amplifiers “A1”, “A2”), comprising: a camera (Figure 3) including a lens (Figure 3, lens “301”), an image capturing device (Figure 3, image sensor device “303”), light detecting elements (Figure 3, image sensor device “303”; *{Pixels are inherent in image sensor devices.}*); and an image processing unit obtaining a value from one pixel or an average value from a plurality of pixels, for each of the color channels as reference signal values, out of reflected light from a scene received by the light detecting elements (Figure 3, white balance signals “B” of “G/B” and “R” of “G/R” are the reference signals; Col. 5, Lines 64-67; Col. 6, Lines 1-40), for practical division by the reference signal values obtained for each of the color channels (see Hashimoto et al., Figure 3, amplifiers “A1”, “A2”; *{The gain for each amplifier is shown in Figure 3 (G/R and G/B). Multiplying by G/R is equivalent to multiplying by G and **dividing** by R. The same applies for G/B.}*), of respective main signal values at each of corresponding locations on coordinates in the main scene captured by the image capturing devices (see Hashimoto et al., Figure 3; *{Main scene signals follow path to the input of A1 and A2 (i.e. base of the triangle representing the amplifiers.)}*), whereby obtaining corrected signal values as corrected values of the main signal value (see Hashimoto et al., Figure 3, R’ and B’ entering the color reproducing correcting circuit). The claim differs from Hashimoto et al. in that it further requires a reflection surface for capture of a main scene in the image capturing devices, the reflection surface being disposed within a visual field of the camera for reflection of light from the main scene or a reference scene disposed near the main scene for reception by the light detecting elements via the lens, and the reference signals determined from the reference scene.

In the same field of endeavor, Tamune teaches an electronic still camera (Figure 1) which employs two image capturing devices (Figure 1, image capturing device for photographing “73” and image capturing device for scene analysis “86”; *{The reference scene is referred to as light entering the lens at an angle, and the main scene is light not entering the lens at an angle (i.e. light entering on the path shown in Figure 1. Both scenes are reflected by the quick return mirror.}*). The first image-capturing device is used for photographing a main scene, and the second image-capturing device is used for scene analysis (color correction) (Col. 4, Lines 43-52; Col. 6, Lines 54-67). Light is sent to the scene analysis image-capturing device via a quick return mirror (Figure 1, quick return mirror “71”; *{The examiner refers to the reflecting surface as the quick return mirror and the lens “301” of HASHIMOTO et al.}*), which reflects the incoming light to said image capturing device (Col. 4, Lines 38-47). In light of the teaching of Tamune, it would have been obvious to one of ordinary skill in the art to include the quick return mirror and second image-capturing device for the white balance calculation in Hashimoto et al., because an artisan of ordinary skill in the art would recognize that this would reduce the amount of time required for image processing which is implemented by the analyzing the photographic scene (see Tamune, Col. 1, Lines 56-60).

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al. (see Patent Number above) in view of Tamune (see Patent Number above) and further in view of Zhang et al. (US # 6,864,911).

As to claim 14, Hashimoto et al., as modified by Tamune, teaches the image capturing system according to claim 1, wherein each of the image capturing devices and the light detecting

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element is constituted by an individual element of a same characteristic (see claim 19 above), the lens being provided individually for each of the image capturing device and the light detecting element (see Hashimoto et al., Figure 3, lens “301”), the angle and coordinate positions of a starting point of the reflection surface being changed continuously in accordance with the focal length of the lens (see claim 25 above), the reflection surface being fixed within a maximum visual field of the lens for selection from a reference image portion, of selected reference portions corresponding to the reflection surfaces in accordance with the focal length (see Hashimoto et al., Figure 1, quick return mirror “71” picks up both main scene and reference scene in the interpretation of the examiner). The claim differs from Hashimoto et al., as modified by Tamune, in that it further requires that the lenses be synchronized in zooming and iris controls.

In the same field of endeavor, Zhang et al. teaches an image capture system where the zooming, shutter control and other parameters are synchronized (Figure 1, Col. 2, Lines 30-44). In light of the teaching of Zhang et al., it would have been obvious to provide synchronized zooming and iris controls for the image capturing devices of Hashimoto et al. and Tamune, because an artisan of ordinary skill in the would recognize that this would allow for identical pictures to be taken; therefore, extracting correct parameters for white balance control.

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al. (see Patent Number above) in view of Tamune (see Patent Number above) and further in view of Ellenby et al. (US # 5,682,332).

As to claim 18, Hashimoto et al., as modified by Tamune, teaches the image capturing system according to claim 2. The claim differs from Hashimoto et al., as modified by Tamune, in that it further requires a CG image generating portion for generation of a computer image and a CG light source determining portion for determining a light source color for the computer image for virtual multiplication of the corrected signal values in each of the color channels with a light source color value obtained by the CG light source determining portion for obtaining a secondary corrected image, the secondary corrected image being merged with the computer image generated by the CG image generating portion into a synthesized image.

In the same field of endeavor, Ellenby et al. teaches an image capturing system (Figure 4) comprising a computer (Figure 4, computer) with an image generating section (Figure 4, image generator "46"), which in accordance with position, attitude, lighting conditions generates an image (Col. 6, Lines 29-33; Lines 54-62). The computer connected to a camera and further comprising a combining section for combining the camera image with the CGI for output to a display (Col. 6, Lines 28-35). In light of the teaching of Ellenby et al., it would have been obvious to one of ordinary skill in the art to include computer of Ellenby et al. to the camera of Hashimoto et al., as modified by Tamune, for composite image display, because an artisan of ordinary skill in the art would recognize that this would provide a system with highly sophisticated image processing manipulations of a real scene (see Ellenby et al., Col. 3, Lines 6-8).

6. Claims 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al. (see Patent Number above) in view of Tamune (see Patent Number above) and further in view of Cooper (US # 6,215,962).

As to claim **33**, Hashimoto et al., as modified by Tamune, teaches the image capturing system according to claim 2. The claim differs from Hashimoto et al., as modified by Tamune, in that it further requires that the correction unit includes means for measuring a complimentary color of a color determined by the reference signal values, and optical filter means including an optical filter for reproducing the complementary color and altering a color of an image which reaches the image capturing devices.

In the same field of endeavor, Cooper teaches a digital camera (Figure 1), which uses a plurality of band-pass filters to determine an illumination condition from the colors of an image, and from this information, it is determined how the image is to be altered to compensate for color differences (Col. 4, Lines 24-67). In light of the teaching of Cooper, it would have been obvious to one of ordinary skill in the art to include the band-pass filter arrangement of Cooper in the image sensor of Hashimoto et al., because an artisan of ordinary skill in the art would recognize that this can effectively compensate for color differences in an image (see Cooper, Col. 3, Lines 11-15) allowing for a more natural picture.

As to claim **34**, Hashimoto et al., as modified by Tamune and Cooper, teaches the image capturing system according to claim 33, wherein the optical filter is disposed so as to alter a color of the image which reaches the light detecting elements (see Cooper, Figure 3, band-pass filters "116A-E"; *{The filters alter whether the color is detected by the photodiode.}*), the means for obtaining the complementary color controlling the optical filter so as to bring the color

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balance of the reference signal values as close as possible to a required color balance (see Cooper, Col. 2, Lines 42-62; Col. 5, Lines 28-50; "...proper selection of band-pass filters...").

As to claim 35, Hashimoto et al., as modified by Tamune, teaches the image capturing system according to claim 33, wherein the optical filter means includes a plurality of preset filters each having a color balance different from the others, one of the present filters closest to the complementary color being selected (see Cooper, Col. 4, Lines 50-67).


Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony J. Daniels whose telephone number is (571) 272-7362. The examiner can normally be reached on 8:00 A.M. - 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AD
10/26/2005


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